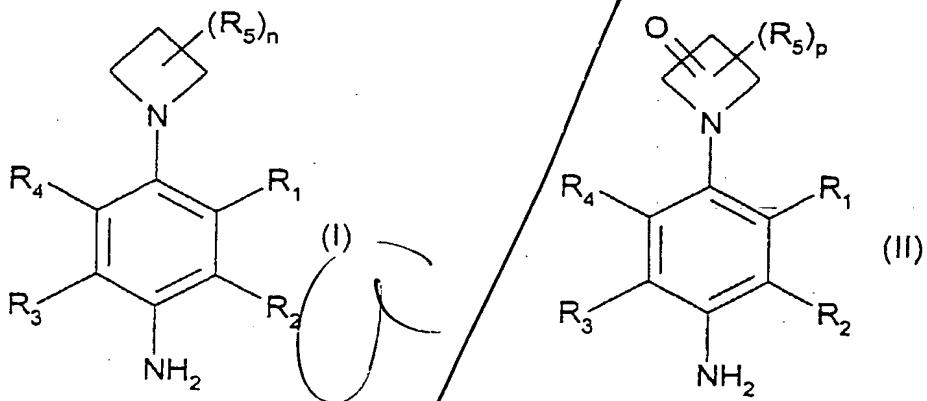


CLAIMS

1. Composition for the oxidation dyeing of keratin fibres, and in particular of human keratin fibres such as the hair, characterized in that it comprises, in a medium which is suitable for dyeing, at least one oxidation base chosen from para-phenylenediamine derivatives containing an azetidinyl group, of formulae (I) and (II) below, and the addition salts thereof with an acid:



in which:

- R_1, R_2, R_3, R_4 and R_5 , which may be identical or different, represent a hydrogen atom; a halogen atom; a hydroxyl radical; a C_1-C_6 alkyl radical; a C_2-C_6 alkenyl radical; a C_2-C_6 alkynyl radical; a C_1-C_6 alkoxy radical; a carbamyl radical; a carboxamide radical; an $N-(C_1-C_6)$ alkylcarbamyl radical; an N,N -di(C_1-C_6)-alkylcarbamyl radical; an amino radical; a (C_1-C_6) alkylamino radical; a di(C_1-C_6)alkylamino radical; a (C_1-C_6) alkyloxy radical; a carboxyl radical; a (C_1-C_6)

C_6) alkylcarboxyl radical; a (C_1-C_6) alkylcarbonyloxy radical; a C_1-C_6 trifluoroalkyl radical; a cyano radical; a (C_1-C_6) alkylthio radical; a formyl radical; a radical $CH=NHR_6$; or a 5- or 6-membered heterocycle containing from 1 to 3 heteroatoms chosen from oxygen, nitrogen and sulphur;

- R_6 represents a C_1-C_6 alkyl radical; an aromatic ring such as, for example, a phenyl ring, or a 5- or 6-membered heteroaromatic ring containing from 1 to 3 heteroatoms chosen from oxygen, nitrogen and sulphur atoms;
- n is an integer between 1 and 4 inclusive;
- p is an integer equal to 1 or 2;
- it being understood that:
 - in formula (I), when $n = 1$ and when R_5 represents a hydrogen atom and when one of the radicals R_1 to R_4 represents a substituted or unsubstituted amino radical, then at least one of the other radicals R_1 to R_4 is other than a hydrogen atom;
 - in formula (I), when $n = 1$, and when R_5 represents a hydrogen atom, and when R_2 and R_3 simultaneously represent a hydrogen atom and when one of the radicals R_1 or R_4 also represents a hydrogen atom, a halogen atom, a C_1-C_6 alkyl radical, a C_1-C_6 hydroxyalkyl radical or a (C_1-C_6) alkoxy(C_1-C_6)alkyl radical, then the other radical R_1 or R_4 cannot represent a substituted or unsubstituted 5-membered heterocycle.

2. Composition according to Claim 1, in

which n is between 1 and 3.

3. Composition according to Claim 1 or 2, characterized in that, in formulae (I) and (II), the halogen atoms are chosen from bromine, chlorine, iodine 5 and fluorine.

4. Compositions according to Claim 1, 2 or 3, characterized in that the para-phenylenediamine derivative(s) containing an azetidinyl group, of formula (I) or (II), are chosen from:

10 - 4-azetidin-1-ylphenylamine;
- 1-(4-aminophenyl)azetidine-2-carboxylic acid;
- 4-azetidin-1-yl-3-methylphenylamine;
- 1-(4-aminophenyl)azetidine-2-carboxamide;
- 1-(4-amino-2-methylphenyl)azetidine-2-carboxylic acid;
15 - 4-azetidin-1-yl-2-methylphenylamine;
- 1-(4-amino-3-methylphenyl)azetidine-2-carboxylic acid;
- 2-(2-amino-5-azetidin-1-ylphenyl)ethanol;
20 - 1-[4-amino-3-(2-hydroxyethyl)phenyl]azetidine-2-carboxylic acid;
- 2-(5-amino-2-azetidin-1-ylphenyl)ethanol;
- 1-[4-amino-2-(2-hydroxyethyl)phenyl]azetidine-2-carboxylic acid;
25 - 1-(5-amino-2-azetidin-1-ylphenyl)ethane-1,2-diol;
- 1-[4-amino-2-(1,2-dihydroxyethyl)phenyl]azetidine-2-carboxylic acid;
- 1-(2-amino-5-azetidin-1-ylphenyl)ethane-1,2-diol;

- 1-[4-amino-3-(1,2-dihydroxyethyl)phenyl]azetidine-2-carboxylic acid;

- 4-azetidin-1-yl-3-dimethylaminomethylphenylamine;

- 1-(4-amino-2-dimethylaminomethylphenyl)azetidine-2-carboxylic acid;

- 4-[3-(2-methoxyethoxy)azetidin-1-yl]phenylamine;

- 4-[2-(2-methoxyethoxy)azetidin-1-yl]-3-methylphenylamine;

- 4-[3-(2-methoxyethoxy)azetidin-1-yl]-2-methylphenylamine;

- 4-azetidin-1-yl-3-fluorophenylamine;

- 4-[3-(2-methoxyethoxy)azetidin-1-yl]-3-fluorophenylamine;

- 1-(aminophenyl)azetidine-4-oxo-2-carboxylic acid;

- 1-(4-aminophenyl)azetidin-3-ol

- 1-(4-aminophenyl)-3-methylazetidin-3-ol

- [1-(4-aminophenyl)azetidin-2-yl]methanol

- [1-(4-aminophenyl)-4-hydroxymethylazetidin-2-yl]methanol

and the addition salts thereof with an acid.

5. Composition according to Claim 4, characterized in that the para-phenylenediamine derivative(s) containing an azetidinyl group, of formula (I) or (II), are chosen from:

- 4-azetidin-1-ylphenylamine;

- 1-(4-aminophenyl)azetidine-2-carboxylic acid;

- 1-(4-aminophenyl)azetidine-2-carboxamide;

- 4-azetidin-1-yl-3-methylphenylamine;

- 1-(4-amino-2-methylphenyl)azetidine-2-carboxylic acid;

- 4-azetidin-1-yl-3-dimethylaminomethylphenylamine;

- 2-(5-amino-2-azetidin-1-ylphenyl)ethanol;

5 - 1-[4-amino-2-(2-hydroxyethyl)phenyl]azetidine-2-carboxylic acid;

- 1-(5-amino-2-azetidin-1-ylphenyl)ethane-1,2-diol;

- 1-[4-amino-2-(1,2-dihydroxyethyl)phenyl]azetidine-2-carboxylic acid;

10 - 1-(2-amino-5-azetidin-1-ylphenyl)ethane-1,2-diol;

- 1-[4-amino-3-(1,2-dihydroxyethyl)phenyl]azetidine-2-carboxylic acid;

- 1-(4-aminophenyl)azetidin-3-ol

- 1-(4-aminophenyl)-3-methylazetidin-3-ol

15 - [1-(4-aminophenyl)azetidin-2-yl]methanol

- [1-(4-aminophenyl)-4-hydroxymethylazetidin-2-yl]methanol

and the addition salts thereof with an acid.

6. Composition according to any one of the
20 preceding claims, characterized in that the para-phenylenediamine derivative(s) containing an azetidinyl group, of formulae (I) and/or (II) and/or the addition salt(s) thereof with an acid, represent from 0.0005% to 12% by weight relative to the total weight of the dye
25 composition.

7. Composition according to Claim 6,
characterized in that the para-phenylenediamine derivative(s) containing an azetidinyl group, of

formulae (I) and/or (II) and/or the addition salt(s) thereof with an acid, represent from 0.005% to 6% by weight relative to the total weight of the dye composition.

5 8. Composition according to any one of the preceding claims, characterized in that it contains one or more couplers chosen from meta-phenylenediamines, meta-aminophenols, meta-diphenols and heterocyclic couplers.

10 9. Composition according to Claim 8, characterized in that the couplers are chosen from 2-methyl-5-aminophenol, 5-N-(β -hydroxyethyl)amino-2-methylphenol, 3-aminophenol, 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxy-15 benzene, 2,4-diamino-1-(β -hydroxyethoxy)benzene, 2-amino-4-(β -hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, sesamol, α -naphthol, 2-methyl-1-naphthol, 6-hydroxy-indole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 20 6-hydroxyindoline, 2,6-dihydroxy-4-methylpyridine, 1-H-3-methylpyrazol-5-one, 1-phenyl-3-methylpyrazol-5-one, and the addition salts thereof with an acid.

10 10. Composition according to Claim 8 or 9, characterized in that the coupler(s) represent(s) from 25 0.0001% to 10% by weight relative to the total weight of the dye composition.

11. Composition according to Claim 10, characterized in that the coupler(s) represent(s) from

0.005% to 5% by weight relative to the total weight of the dye composition.

12. Composition according to any one of the preceding claims, characterized in that it contains at least one additional oxidation base chosen from para-phenylenediamines other than compounds of formulae (I) and (II) as defined in any one of Claims 1 to 4, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases, and the addition salts thereof with an acid.

13. Composition according to Claim 12, characterized in that the additional oxidation base(s) represent(s) from 0.0005% to 12% by weight relative to the total weight of the dye composition.

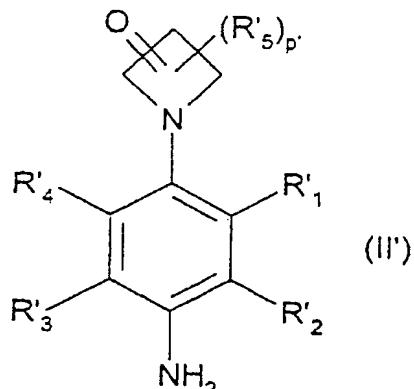
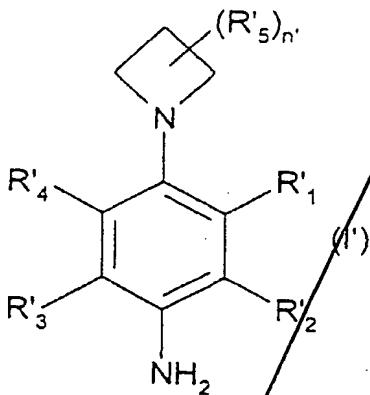
14. Composition according to any one of the preceding claims, characterized in that the addition salts with an acid are chosen from the hydrochlorides, hydrobromides, sulphates, citrates, succinates, tartrates, lactates, phosphates and acetates.

15. Process for the oxidation dyeing of keratin fibres, characterized in that at least one dye composition as defined in any one of Claims 1 to 14 is applied to the said fibres, and in that the colour is developed at acidic, neutral or alkaline pH using an oxidizing agent which is added to the dye composition just at the time of use, or which is present in an oxidizing composition which is applied simultaneously or sequentially.

16. Process according to Claim 15,
 characterized in that the oxidizing agent present in
 the oxidizing composition is chosen from hydrogen
 peroxide, urea peroxide, alkali metal bromates,
 5 persalts, peracids and enzymes.

17. Multi-compartment device, or multi-
 compartment dyeing "kit", a first compartment of which
 contains a dye composition as defined in any one of
 Claims 1 to 14 and a second compartment of which
 10 contains an oxidizing composition.

18. para-Phenylenediamine derivatives
 containing an azetidinyl group, of formulae (I') and
 (II') below, and the addition salts thereof with an
 acid:



in which:

- R'1, R'2, R'3, R'4 and R's, which may be identical
 or different, represent a hydrogen atom; a halogen
 atom; a hydroxyl radical; a C₁-C₆ alkyl radical; a C₂-C₆
 20 alkenyl radical; a C₂-C₆ alkynyl radical; a C₁-C₆ alkoxy
 radical; a carbamyl radical; a carboxamide radical; an

N-(C₁-C₆)alkylcarbamyl radical; an N,N-di(C₁-C₆)-alkylcarbamyl radical; an amino radical; a (C₁-C₆)alkylamino radical; a di(C₁-C₆)alkylamino radical; a (C₁-C₆)alkylcarbonyl radical; a carboxyl radical; a 5 (C₁-C₆)alkylcarboxyl radical; a (C₁-C₆)alkylcarbonyloxy radical; a C₁-C₆ trifluoroalkyl radical; a cyano radical; a (C₁-C₆)alkylthio radical; a formyl radical; a radical CH=NHR'₆; or a 5- or 6-membered heterocycle containing from 1 to 3 heteroatoms chosen from oxygen, 10 nitrogen and sulphur;

- R'₆ represents a C₁-C₆ alkyl radical; an aromatic ring such as, for example, a phenyl ring, or a 5- or 6-membered heteroaromatic ring containing from 1 to 3 heteroatoms chosen from oxygen, nitrogen and sulphur 15 atoms;

- n' is an integer between 1 and 4 inclusive;

- p' is an integer equal to 1 or 2;

it being understood that:

- in formula (I), when n' = 1 and when R'₅ represents 20 a hydrogen atom and when one of the radicals R'₁ to R'₄ represents a substituted or unsubstituted amino radical, then at least one of the other radicals R'₁ to R'₄ is other than a hydrogen atom;

- in formula (I), when n' = 1, and when R'₅ 25 represents a hydrogen atom, and when R'₂ and R'₃ simultaneously represent a hydrogen atom and when one of the radicals R'₁ or R'₄ also represents a hydrogen atom, a halogen atom, a C₁-C₆ alkyl radical, a C₁-C₆

hydroxyalkyl radical or a (C₁-C₆)alkoxy(C₁-C₆)alkyl radical, then the other radical R'₁ or R'₄ cannot represent a substituted or unsubstituted 5-membered heterocycle;

5 with the exclusion of:

- 4-azetidin-1-yl-3-fluorophenylamine;
- 3-fluoro-4-[3-(2-methoxyethoxy)azetidin-1-yl]-phenylamine;
- diethyl 1-(4-aminophenyl)-2-oxoazetidine-

10 3,3-dicarboxylate;

- diethyl 1-(4-aminophenyl)-2-[1,3]dioxolan-2-yl-4-oxoazetidine-3,3-dicarboxylate;
- 1-(4-aminophenyl)-4-oxazetidine-2-carboxylic acid;
- methyl 1-(4-aminophenyl)-4-oxoazetidin-2-yl-

15 methanesulphonate;

- methyl 1-(4-aminophenyl)-4-oxoazetidin-2-yltoluene-4-sulphonate.

19. para-Phenylenediamine derivatives containing an azetidinyl group according to Claim 18, 20 characterized in that they are chosen from:

- 4-azetidin-1-ylphenylamine;
- 1-(4-aminophenyl)azetidine-2-carboxylic acid;
- 1-(4-aminophenyl)azetidine-2-carboxamide;
- 4-azetidin-1-yl-3-methylphenylamine;
- 1-(4-amino-2-methylphenyl)azetidine-2-carboxylic acid;
- 4-azetidin-1-yl-2-methylphenylamine;
- 1-(4-amino-3-methylphenyl)azetidine-2-carboxylic

acid;

- 2-(2-amino-5-azetidin-1-ylphenyl)ethanol;

- 1-[4-amino-3-(2-hydroxyethyl)phenyl]azetidine-2-carboxylic acid;

5 - 2-(5-amino-2-azetidin-1-ylphenyl)ethanol;

- 1-[4-amino-2-(2-hydroxyethyl)phenyl]azetidine-2-carboxylic acid;

- 1-(5-amino-2-azetidin-1-ylphenyl)ethane-1,2-diol;

- 1-[4-amino-2-(1,2-dihydroxyethyl)phenyl]azetidine-

10 2-carboxylic acid;

- 1-(2-amino-5-azetidin-1-ylphenyl)ethane-1,2-diol;

- 1-[4-amino-3-(1,2-dihydroxyethyl)phenyl]azetidine-2-carboxylic acid;

- 4-azetidin-1-yl-3-dimethylaminomethylphenylamine;

15 - 1-(4-amino-2-dimethylaminomethylphenyl)azetidine-2-carboxylic acid;

- 4-[3-(2-methoxyethoxy)azetidin-1-yl]phenylamine;

- 4-[2-(2-methoxyethoxy)azetidin-1-yl]-3-methyl-phenylamine;

20 - 4-[3-(2-methoxyethoxy)azetidin-1-yl]-2-methyl-phenylamine;

- 1-(4-aminophenyl)azetidin-3-ol

- 1-(4-aminophenyl)-3-methylazetidin-3-ol

- [1-(4-aminophenyl)azetidin-2-yl]methanol

25 - [1-(4-aminophenyl)-4-hydroxymethylazetidin-2-yl]-methanol

and the addition salts thereof with an acid.

20. para-Phenylenediamine derivatives

containing an azetidinyl group according to Claim 18 or 19, characterized in that the addition salts with an acid are chosen from the hydrochlorides, hydrobromides, sulphates, citrates, succinates, tartrates, lactates, 5 phosphates and acetates.

21. Derivatives according to any one of Claims 18 to 20, in which n is between 1 and 3.

22. Use of the para-phenylenediamine derivatives containing an azetidinyl group, of formulae 10 (I), (II), (I') and (II') as defined in any one of Claims 1 to 7 and 18 and 20, as oxidation bases for the oxidation dyeing of keratin fibres.

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